

POST-CLOSURE PLAN FOR THE FORMER EVAPORATION LAGOON

*Former Abbott Property
Wichita, Kansas*

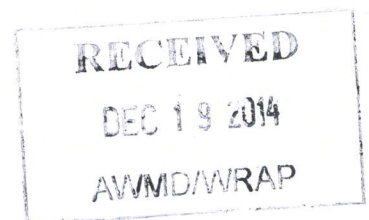
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EXECUTIVE SUMMARY

This document is Abbott's Post-Closure Plan for the Abbott Former Evaporation Lagoon (FEL) in Wichita, Kansas and was prepared cooperatively by Abbott Laboratories and Environmental Resources Management (ERM). This Post-Closure Plan has been updated to incorporate comments provided by the Kansas Department of Health and Environment (KDHE) in their letter to Abbott, dated April 18, 2014 regarding modifications to the groundwater and leachate monitoring program at the FEL.

This plan consists of 5 key steps as follows:

- Step 1 - Cap Enhancement
- Step 2 - Leachate Monitoring
- Step 3 - Operations & Maintenance Plan of Lagoon Cap
- Step 4 - Confirmation of Limited Groundwater Contaminants
- Step 5 - Implementation of Monitored Natural Attenuation to Closure

Each of these steps is detailed in the following sections. Abbott has already completed Steps 1 through 4 (with the exception of additional inspections to be conducted in Step 3) in accordance with various correspondences and approvals by the KDHE.

CAP ENHANCEMENT (STEP 1)

Monitoring data indicated that the previously constructed cap covering the FEL did not sufficiently prevent the generation of leachate; therefore, it was replaced with an enhanced cap. The enhanced cap was engineered and constructed with impermeable materials and proper grading to prevent ponding, infiltration of precipitation, and generation of leachate. Plans and cross-sections of the enhanced cap design are provided in Appendix 1.

The enhanced cap was completed in October 2005, under a KDHE-approved Construction Quality Assurance (CQA) Plan, and meets current KDHE surface impoundment standards. A post CQA Report was submitted to, and approved by, the KDHE in March 2006. Copies of KDHE approvals are provided in Appendix 2, and select pictures taken during the various phases of cap enhancement are provided in Appendix 3.

3.0

LEACHATE MONITORING (STEP 2)

3.1

SUMMARY OF MONITORING TO DATE

The leachate collection system remains in place and in operation. A representative cross-section of the leachate collection system design is provided in Figure 1. Abbott (after notification to the KDHE UIC Program) discontinued using the UIC well for the disposal of the collected leachate since the enhanced cap has been effective in eliminating the leachate from the FEL.

The effectiveness of the enhanced cap at eliminating leachate from the FEL has been confirmed by monitoring the volume of leachate collected in the collection sump and comparing it to the volume of precipitation in the area (as measured at the nearby Wichita airport and reported by the National Oceanic and Atmospheric Agency {NOAA} National Weather Service). Monitoring since 2005 (data provided in Appendix 4) shows that from before the cap was enhanced, an average of 2,600 gallons per week of leachate was generated. Leachate then decreased over the years to where it is no longer being generated, confirming that the enhanced cap is an effective control for eliminating leachate generation from the FEL.

Based upon this monitoring and the design of the cap, Abbott has concluded that the small volume of residual leachate that continues to collect in the sump is from soil moisture condensation and the lateral movement of perched water from around the outside edges. This conclusion is supported by the Remedial Facility Investigation confirming perched water in and around the area of the FEL at a depth in the zone of the leachate collection system.

To further evaluate the effectiveness of the enhanced cap, Abbott evaluated results of quarterly contaminant monitoring of leachate collected in the leachate collection sump conducted before and shortly after cap enhancement. This evaluation showed after the new cap was put in place, a significant reduction in leachate collected with no correlation of rain levels, and in general, concentrations of contaminants appeared to have decreased since the cap was enhanced. A summary table and graphs of sump leachate contaminants are provided in Appendix 5, and show concentrations of contaminants have decreased overall.

Since the 2009 PCP approval, leachate monitoring (LM) has shown that there has not been sufficient leachate generated to collect a representative sample for analysis during any of the LM events (LM Years 1 through 5). The cessation of leachate demonstrates that the enhanced cap is working as designed and has eliminated leachate generation from the FEL. In accordance with Section 3.2.2 of the PCP that was prepared and approved in 2009 (hereinafter referred to as the 2009 PCP), Abbott requested to no longer be required to complete leachate monitoring. On April 18, 2014, KDHE approved this request, and Abbott will no longer monitor leachate on a regular basis. With the elimination of leachate generation and monitoring, KDHE also approved removing the leachate collection sump building since it is no longer needed, in poor condition and creates a safety concern. After removal of the building, the leachate discharge point will remain accessible; in a sealed and secure condition for at least 5 years before final sealing. After such time Abbott may request KDHE approval for complete removal.

As part of the enhanced cap design, Abbott established a site-specific Operations & Maintenance Plan (O&M Plan) to ensure the integrity of the enhanced cap and leachate collection system is maintained. The O&M Plan ensures the following:

- Cap and cover integrity
- Proper grade
- Berm integrity
- Drainage system integrity and proper flow
- No erosion problems
- Leachate collection system integrity
- Security to restrict access
- Inspections

The O&M Plan specifies that if any conditions affecting cap or leachate collection system integrity are identified during the inspections, repairs/modifications will be implemented as needed. Cap and leachate collection system inspections were conducted as required in the 2009 PCP and O&M Plan, and confirmed no problems identified. As a result, Abbott requested revision of inspection frequency to the following formal inspection and reporting frequency:

- O&M Years 6-8 (2014-2016): annually
- O&M years 9 (2017) through as long as Abbott is still responsible for the O&M of the FEL: bi-annually

Informal cap integrity inspections (with no report to KDHE) will be conducted during each mowing event. KDHE approved this request on April 18, 2014, and inspections will be conducted accordingly. Each formal inspection will be documented on a Lagoon Cap and Leachate Inspection Log described within the O&M Plan.

5.0 CONFIRMATION OF LIMITED GROUNDWATER CONTAMINANTS (STEP 4)

5.1 REVIEW OF EXISTING DATA

Abbott completed a comprehensive review of over 28 years of groundwater monitoring data to confirm the limited contaminants remaining in the groundwater. The comprehensive data evaluation and conclusions are summarized as follows:

All of the historical data and reports in Abbott's possession (dating back to 1983) were assembled and reviewed. The Resource Conservation and Recovery Act (RCRA) Remedial Facility Investigation (RFI) report that was completed in 1992, which contained long-term data, indicates 100 contaminants had routinely been screened at the site. According to the RFI, these chemicals included all of the potential chemicals used and generated at the facility in addition to those that may have originated from neighboring industrial facilities. A list of these 100 contaminants is provided in Table 1. The RFI further indicates that 59 of the 100 contaminants were excluded as contaminants of concern as they were always non-detect. These 59 contaminants have red strikeouts through them in Table 2. An additional 17 contaminants were also excluded by the US EPA through the RFI process due to their respective low frequencies of detection (10% of the time or less). These contaminants have green strikeouts through them in Table 2. Two contaminants were excluded as they were concluded to be laboratory contaminants. These compounds have violet strikeouts through them in Table 2. The remaining 22 compounds in Table 2 were considered representative contaminants at the site. Of these 22 compounds, it was determined that 10 were not attributable to Abbott and were removed from the list of Abbott contaminants of concern as it was concluded they were never used by Abbott and thought to have migrated onto the site from neighboring facilities. These 10 compounds have dark blue strikeouts through them in Table 2. Therefore, the remaining 12 compounds with no strikeouts and bolded in Table 2 were considered attributable to Abbott.

Abbott conducted a comprehensive review of the historical data associated with these 12 compounds, to confirm the frequency of sampling, analysis, and levels of detection, and to determine whether future monitoring is warranted. A summary table for each compound was created to detail quarters of sampling, wells sampled, and Method Detection Levels (MDLs), where applicable. Each of these summary tables is provided in Appendix 6. As indicated in these tables, each of the compounds had been routinely analyzed in numerous wells since 1983 (with the exception of toluene - which was last analyzed for in 1991).

REMAINING CONTAMINANTS

Based upon review of groundwater monitoring data indicated in Section 5.1, and review of results of groundwater monitoring under the 2009 PCP, Abbott requested (in accordance with Section 6.2 of the 2009 PCP) that several compounds be removed from the contaminants of concern (COC) list and no longer have to be analyzed for during groundwater monitoring. These compounds and rationale for removal are:

- 3(n,n-Dimethylamino)propyl nitrile:
 - ND in all wells since 1Q90 (42 rounds of monitoring)
- Aniline:
 - ND in all wells since 1Q93 (34 rounds of monitoring)
- Cyclohexylamine:
 - ND in all wells since 4Q90 (41 rounds of monitoring)
- n,n-Dimethylcyclohexylamine:
 - ND in all wells since 3Q97 (25 rounds of monitoring)
- n-Methyldicyclohexylamine:
 - ND since 4Q90 (42 rounds of monitoring)
- Pentamethyldipropylenetriamine:
 - ND since 1Q90 (42 rounds of monitoring)
- Piperidine:
 - ND since 1Q90 (41 rounds of monitoring)
- n-Nitrosodi-N-butylamine:
 - ND since 1Q09 (10 rounds of monitoring)
- Ethylbenzene:
 - ND since 1Q09 (10 rounds of monitoring)
- Xylene:
 - ND since 1Q09 (10 rounds of monitoring)

Based upon their review, KDHE approved on April 18, 2014, removal of the following COCs listed below that are no longer required for analysis:

- Cyclohexylamine
- Ethylbenzene
- Xylene

Leaving the following as KDHE-approved COCs for the site:

- 3(n,n-Dimethylamino)propyl nitrile
- Aniline
- n,n-Dimethylcyclohexylamine
- n-Methyldicyclohexylamine
- Pentamethyldipropylenetriamine

- Piperidine
- n-Nitrosodi-N-butylamine
- n-Methylcyclohexylamine
- Dicyclohexylamine
- o-Toluidine
- Arsenic
- Toluene

IMPLEMENTATION OF MONITORED NATURAL ATTENUATION TO CLOSURE (STEP 5)

After completing a comprehensive review of over 28 years of groundwater monitoring data Abbott conducted an evaluation of remedial technologies to determine the most feasible technology to implement at the site. While the former groundwater extraction and treatment was effective in containing and reducing the contaminant plume and mass, it was concluded that it would not further reduce the contaminants to the concentrations needed for closure. Evaluation of other insitu remedial technologies such as insitu chemical oxidation, bioremediation, thermal treatment, and other physical treatment concluded that they would not be feasible, nor warranted given the nature of the contamination. Monitored-natural attenuation (MNA) was also evaluated and concluded to be an effective and feasible approach, and would be implemented, for remediation of the groundwater impact from the former evaporation lagoon. This conclusion is based upon several technical factors, primarily:

- Evaluation of long-term groundwater monitoring results (as discussed in Section 5) confirming that the majority of groundwater contaminants attributable to Abbott have naturally degraded / attenuated and degraded over time.
- Confirmation that concentrations of the limited remaining contaminants in the groundwater are generally decreasing with time.
- Groundwater contaminant modeling concluding contaminant degradation will continue with time to below risk-based standards before reaching the property line.

MNA was implemented at the site in July of 2009.

GROUNDWATER MONITORING AND REPORTING

MNA will involve continued groundwater monitoring (GWM) to verify there is no off-site migration of any of the COCs in concentrations above established standards. During this monitoring, wells MW-4, 8, 16, and 102 clusters (deep and shallow) will be sampled and analyzed for the remaining COCs established in Step 4 and indicated in Section 5.2 of this Plan. These wells will continue to be monitored given their downgradient location from the former lagoon and representative positioning at the site. The locations of these wells are shown in Figure 2. Beginning in GWM

Year 7: 2015, these wells will be monitored on a semi-annual basis for the following COCs:

- Aniline
- n-Methylcyclohexylamine
- Dicyclohexylamine
- o-Toluidine
- Arsenic (total and dissolved)
- Toluene

As aniline has been added to the KDHE RSK Manual, Abbott will analyze aniline under an analytical method with a new method detection limit (MDL) for aniline below its residential RSK value of 0.108mg/L.

Additionally, Abbott will monitor these wells on a 5-year basis for the additional COCs below (starting from the last time they were monitored in GWM Year 6: October 2014):

- 3(n,n-Dimethylamino)propyl nitrile
- n,n-Dimethylcyclohexylamine
- n-Methyldicyclohexylamine
- Pentamethyldipropylenetriamine
- Piperidine
- n-nitrosodi-N-butylamine

At this time, KDHE has not established Cleanup Standards for these COCs. If Cleanup Standards are established in the future, they may be added to the semi-annual monitoring schedule.

Abbott will request removal from the COC / analyte list, those COCs that have not been detected below at or below their respective RSKs and/or MDLs for six consecutive monitoring events.

Each of the above COCs will be monitored in accordance with the SAP. COC concentrations will then be compared to respective Cleanup Standards.

After each monitoring event, a Semi-Annual Groundwater Monitoring Report will be submitted to the KDHE. This report will summarize the sampling event and results and will include the components detailed in the KDHE Quarterly/Semi-Annual Groundwater Monitoring Report Review Checklist provided in Appendix 7. These reports will include static water level measurements from MW-4, 8, 16, and 102 clusters obtained when monitored by Abbott; as well as static water levels of all the Abbott wells when obtained by Oxy-Chem during their monitoring of

the wells. In addition, an Annual Groundwater Monitoring Report will be submitted to the KDHE by March 1 of each year. This report will summarize the activities and results for Abbott groundwater monitoring from the previous year and will include the components detailed in the KDHE Annual Groundwater Monitoring Report Review Checklist provided in Appendix 7. In addition, this report will provide a table summarizing the previous year's results of Oxychem's monitoring of Abbott wells for the following:

- Dichloromethane (Methylene chloride)
- 1,2 Dichloroethane
- Trichloromethane
- Trichloroethylene
- Tetrachloroethylene
- Tetrachloromethane (Carbon tetrachloride)
- Vinyl chloride
- Benzene

6.2 *FINAL CLOSURE REPORTING AND KDHE CONCURRENCE OF CLOSURE*

When the following conditions are achieved, Abbott will submit a Final Closure Report and request concurrence of closure with no further action being required from the KDHE:

1. Groundwater samples have not contained any contaminants in concentrations exceeding their respective Cleanup Standards for six consecutive rounds of semi-annual monitoring (for a total of three years of monitoring).
2. Conditions of the enhanced cap remain such that there is no ponding on top of the cap and no significant increase in liquid collected through the leachate collection system.
3. There is no other such evidence of questionable integrity of the enhanced cap.

Those COCs for which there have been no exceedances for six consecutive rounds of semi-annual monitoring, will be proposed for removal as a COC and eliminated from monitoring requirements. If at any time an alternative closure approach is confirmed to be feasible, Abbott reserves the right to implement such approach after obtaining KDHE approval.